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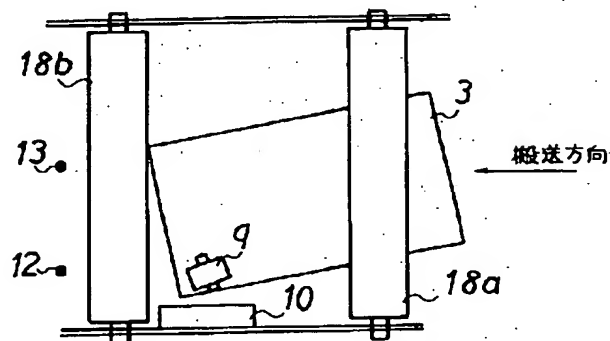
(54) 【発明の名称】 帳票の傾き修正機構

(57) 【要約】

【目的】 大きく傾いて搬送されてきた帳票の左右位置の位置決めおよび傾き修正を安定に行う。

【構成】 搬送された帳票3の傾き量をセンサ12、13で測定し、帳票3の傾きが基準面10の反対側が先に進む方向の場合、ドライブローラ17a、17b間で帳票3を挟ませ、その先端を押圧ローラ18bとドライブローラ17bの噛み合せ部に当接し傾きを修正した後、斜行ローラ9により基準面10へ帳票3の側面を押し当てシフトの補正を行う。

図 1



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【特許請求の範囲】

【請求項1】 搬送路上で平行に配置された2個の駆動ローラと、該駆動ローラとともに帳票を挾持する押圧ローラと、該駆動ローラおよび押圧ローラを独立に駆動／押圧する手段と、帳票搬送方向に対して斜めに取り付けた斜行ローラと、該斜行ローラを駆動／押圧する手段と、搬送路上に設けた複数のセンサと、前記2組のローラ間の搬送路端部に設けたガイド手段と、該ガイド手段の基準面端部に設けたセンサと、前記複数センサの検知にて得られた搬送帳票の傾き量をもとにして動作順序を選択し、駆動ローラ間で該帳票を撓ませ該帳票の先端を一方の駆動ローラと押圧ローラの噛み合せ部に当接させる制御と、前記基準面端部センサにて帳票が検知されるまで、押圧ローラを解除して斜行ローラを押圧／駆動し該帳票の側面をガイド手段に押し当てさせる制御とを行なう手段とを備えたことを特徴とする帳票の傾き修正機構。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は、帳票の傾き修正機構に関し、特に帳票を正確な位置に搬送する必要がある印刷装置、OCR／イメージ読取装置に好適な帳票の傾き修正機構に関する。

【0002】

【従来の技術】 従来、帳票の傾き修正機構としては、例えば、特公昭62-38261号公報に記載されているように、平行に配置された2組のドライブローラにおいて、搬送方向側ドライブローラを当接紙の先端が通過した後、搬送方向に対し逆回転させ、同時に搬送方向後側ドライブローラを停止させ、2組のローラ間で帳票を撓ませ、帳票先端をドライブローラの噛み合せ部に当接させ、帳票の傾きを修正する方式が知られている。上記方式は、簡単な構成で帳票の傾きを修正可能であるが、帳票の搬送方向と直角方向の位置決めを行なうことに関しては、配慮がなされていない。

【0003】

【発明が解決しようとする課題】 一般に、印字枠のある帳票に印字する場合、帳票の傾きの修正のみでなく帳票の左右方向の位置決めが必要である。しかし、上記従来技術では、帳票の傾きの修正は可能であるが、左右方向の位置決めについては配慮がなされていない。この左右方向の位置決めを行う方法としては、例えばローラで帳票側面を基準面に押し当てる方法が知られている。しかし、ローラで基準面への押し当てのみでは、必要な帳票の傾き精度が得られない場合があり、ローラでの基準面押し当てと、上記従来技術との併用が考えられる。ここで帳票の種類が1種であれば、ローラは基準面に対し直角で同一の駆動量で、帳票を基準面に押し当てることが可能であるが、多種類の大きさ、厚さを有する帳票を基準面に直角に押し当てる場合には、帳票の重心位置、抵

抗力が異なり不具合が生じる。そこで、搬送方向に対して斜めに帳票を動かして基準面に押し当てる方式がとられる。しかし、この場合においても、押し当て前の傾き量が大きいと、帳票エッジ部が基準面に衝突して、用紙折れやジャムが生じ、傾き量が増大する。本発明の目的は、このような問題点を改善し、傾き量大きい帳票に対しても安定な傾き修正機構を提供することにある。すなわち、大きな傾きで搬送されてきた帳票の用紙ジャムや折れ等を防止し、左右の位置決めおよび傾きの修正を安定に行うことを目的とする。

【0004】

【課題を解決するための手段】 上記目的を達成するため、本発明の傾き修正機構は、搬送路上で平行に配置された2個の駆動ローラ（図2の17a, 17b）と、該駆動ローラとともに帳票を挾持する押圧ローラ（図1の18a, 18b）と、該駆動ローラおよび押圧ローラを独立に駆動／押圧する手段（駆動モータ等（図示せず））と、帳票搬送方向に対して斜めに取り付けた斜行ローラ（図1の9）と、該斜行ローラを駆動／押圧する手段（ブラケット、駆動モータ等（図示せず））と、搬送路上に設けた複数のセンサ（図1の12, 13）と、前記2組のローラ間の搬送路端部に設けたガイド手段（図1の10）とを有し、制御部（CPU等、図示せず）は、前記センサにて搬送帳票の傾きを測定し得られた傾き量に応じて各動作順序を選択し、「2組の平行に配置したローラ間で帳票を撓ませ、その先端を一方の駆動ローラと押圧ローラの噛み合せ部に当接させる制御（傾き修正）」と「前記基準面端部センサにて帳票が検知されるまで、押圧ローラを解除して斜行ローラを押圧／駆動し帳票の側面をガイド手段に押し当てさせる制御（左右の位置決め）」を行なうことに特徴がある。

【0005】

【作用】 本発明においては、搬送された帳票の傾きが基準面側に対し反対側が進む方向の傾きの場合、その傾き量が大きいと、斜行ローラにより基準面に押し当てたとき、帳票のエッジ部が先に基準面と衝突するため、先に2組のドライブローラ間の撓みによりまず傾きを取った後、斜行ローラによる基準面への押し当てを行う。これにより、基準面に大きな傾きで帳票が衝突となくなるため、折れ、ジャムを防止できる。また、基準面近傍にセンサを設けることにより、斜行ローラにより大きな傾きの帳票を押し当てても帳票のエッジが基準面に強く押し当たる前に斜行ローラの駆動を停止させ、用紙折れやジャムを防止できる。例えば、搬送された帳票の傾きが基準面側に対して反対側が先に進むような傾きであり、傾き量が予め設定された傾き量より大きい場合、2組の平行に配置されたローラ（ドライブローラおよびプレッシャローラ）により傾きを修正した後に、斜行ローラにより帳票側面を基準面に押し当て帳票の左右位置と傾きを修正させ、さらに傾き量が設定値より大きい場合には、

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2組の平行に配置されたローラにより傾きを修正する。また、この場合、基準面近傍に配置したセンサにより帳票が検出されるまで、斜行ローラにて帳票を搬送し、次に2組の平行に配置されたローラにより傾きを修正する。なお、他の場合には、斜行ローラにより規定量のみを搬送する。このように、大きな傾きで搬送されてきた帳票に対し、左右の位置決め（シフト補正）および傾きの修正を安定に行うことが可能である。

【0006】

【実施例】以下、本発明の一実施例を図面により説明する。図1は、本発明の第1の実施例における傾き修正機構の平面図、図2は図1の側断面図であり、図3(a)～(e)は本実施例の動作を示す。まず、構成について説明する。本実施例の傾き修正機構は、ドライローラ17a、17bと、それに対向するプレッシャローラ18a、18bと、帳票搬送方向に対して斜めに取付けた斜行ローラ9と、帳票を押し当てる基準面10と、帳票の傾き量を検出するためのセンサ12、13と、用紙ガイド1a、1b、2、3a、3bからなる。このプレッシャローラ18a、18bは、それぞれ押圧解除手段（図示せず）によりドライローラ17a、17bから持ち上げ自在に構成されている。また、ドライローラ17a、17bは、モータ等の駆動手段（図示せず）により独立に駆動可能である。また、斜行ローラ9は、斜行ローラ上下駆動機構（図示せず）により搬送面に圧接自在に構成されている。この斜行ローラ上下駆動機構は、例えば、斜行ローラの軸に回転自在に支持されたブラケット、駆動用モータ、ウォーム軸、駆動力を伝達するベルト等から構成してもよい。なお、各駆動手段の制御を含む機構全体の制御は、図示していない制御部（例えば、CPU等の処理装置）によって行うものとする。

【0007】ここで、本実施例の傾き修正動作について説明する。まず、図3(a)のように、帳票3をセンサ12、13位置まで搬送し、センサ12、13により帳票の傾き量を測定する。その結果、センサ12、13により測定した傾きが、基準面10と反対側が先に進む方向の傾き（図1に示した帳票3の傾き方向）であって予め設定された傾き量より大きい場合には、ドライローラ17aを停止させる。次に、図3(b)のように、ドライローラ17a、17bを帳票搬送方向と逆方向に回転させることにより、ドライローラ17a、17b間で帳票3を撓ませる。こうして、帳票先端をドライローラ17bとプレッシャローラ18bの噛み合せ部に当接させ、傾きの修正を行う。次に、図3(c)のように、ドライローラ17bを僅かに正転させ、帳票3を噛み込ませた後、プレッシャローラ18aを押圧解除手段により持ち上げる。次に、図3(d)のように、斜行ローラ9を斜行ローラ上下駆動機構により搬送面に圧接

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させ、プレッシャローラ18bを持ち上げる。従って、プレッシャローラ18a、18bとも圧接解除される。さらに、斜行ローラ9を駆動し、基準面10に帳票3を押し当ててスキューを修正する。最後に、図3(e)のように、プレッシャローラ18a、18bを圧接させ、斜行ローラを持ち上げて搬送を行う。この際、センサ12、13によりスキュー量を測定し、予め設定した傾き量より大きい場合には、再度、図3(b)の動作を行う。また、図3(a)で測定した傾き量が予め設定された傾き量より小さく、かつ上記と逆方向の傾き（図1に示した帳票3と逆の傾き）である場合には、帳票3を一定量戻し、図3(d)に示したように、プレッシャローラ18a、18bを持ち上げ、斜行ローラ9を下げて基準面10への押し当てを行った後、図3(b)に示した動作を行う。

【0008】図4は、本発明の第2の実施例における傾き修正機構の平面図である。本実施例は、第1の実施例の構成に加え、基準面10の近傍に帳票3を検出するセンサ14を追加したものである。本実施例では、帳票3を斜行ローラ9により基準面10に押し付ける場合、センサ14が帳票3を検出すると、斜行ローラ9の駆動を停止して、ドライローラ17a、17b間の撓みによる傾き修正を実行する。また、帳票3の傾きが図示とは逆の方向に大きい場合であって、帳票3の側面が基準面10のエッジ10aに当たり、センサ14で帳票3を検出できなくなった場合には、斜行ローラ9を一定量駆動し、センサ14が帳票3を検出してから、上記と同様に斜行ローラ9の駆動停止を行うように制御する。

【0009】

【発明の効果】本発明によれば、大きい傾きで搬送されてきた帳票に対し、用紙折れ、ジャム等を発生させることなく、左右位置の位置決めと傾きの修正を安定に行うことができる。

【図面の簡単な説明】

【図1】本発明の第1の実施例における傾き修正機構の平面図である。

【図2】本発明の第1の実施例における傾き修正機構の側断面図である。

【図3】本発明の第1の実施例における傾き修正動作を示す図である。

【図4】本発明の第2の実施例における傾き修正機構の平面図である。

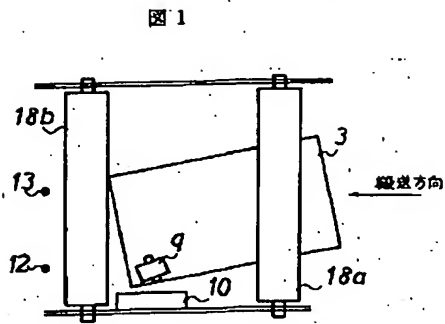
【符号の説明】

1a、1b、2、3a、3b：用紙ガイド、3：帳票、9：斜行ローラ、10：基準面、10a：基準面のエッジ、12、13、14：センサ、17a、17b：ドライローラ、18a、18b：プレッシャローラ。

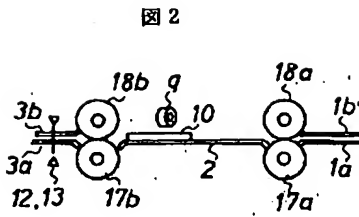
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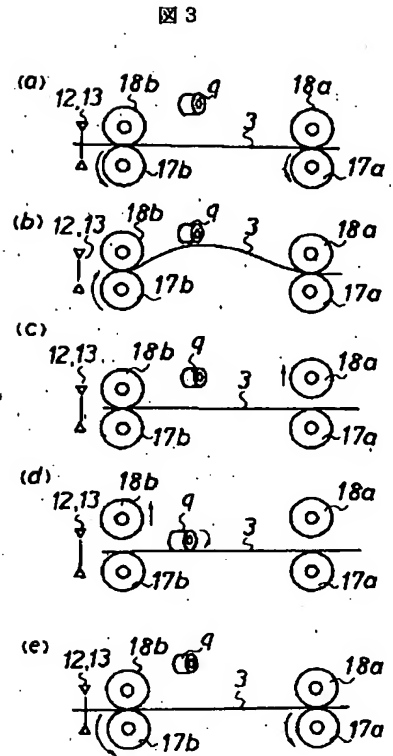
【図 1】



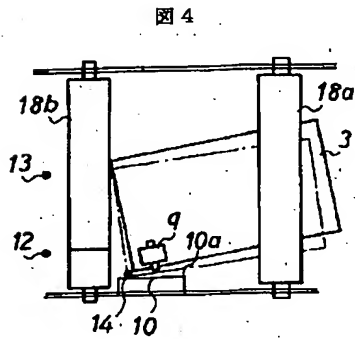
【図 2】



【図 3】



【図 4】



FORM TILT CORRECTION MECHANISM

Patent Number: JP7334630
Publication date: 1995-12-22
Inventor(s): NAKATSU AKIJI
Applicant(s): HITACHI LTD
Requested Patent: ☐ JP7334630
Application Number: JP19940126084 19940608
Priority Number(s):
IPC Classification: G06K13/063; B65H9/00
EC Classification:
Equivalents:

Abstract

PURPOSE: To provide a correction mechanism which can perform the stable right-left positioning and the tilt correction of forms by controlling these operations to prevent the jam, breakage, etc., of a form that has been conveyed with a large tilt.

CONSTITUTION: A form 3 is conveyed to the positions of sensors 12 and 13, and the tilt amount of the form 3 is measured. If the form 3 tilts in the direction where the side of the form 3 opposite to its reference face 10 travels first with a tilt amount larger than a set value, the revolutions of drive rollers are stopped. Then, the drive rollers are revolved in the direction opposite to the conveying direction of the form 3, and the form 3 is bent between the drive rollers so that the tip of the form 3 touches the drive rollers and a pressure roller 18b. Thus, the tilt of the form 3 is corrected. Then, the drive rollers are revolved forward to bite the form 3 and a pressure roller 18a is lifted together with an oblique roller 9 pressed to a conveying surface. The roller 18b is lifted and the press contact states of both rollers 18a and 18b are canceled for correction of the skew of the form 3. Thus, the form 3 is conveyed.

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PATENT ABSTRACTS OF JAPAN

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(21)Application number : 06-126084

(71)Applicant : HITACHI LTD

(22)Date of filing : 08.06.1994

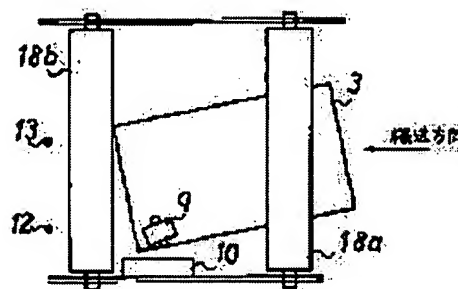
(72)Inventor : NAKATSU AKIJI

(54) FORM TILT CORRECTION MECHANISM

(57)Abstract:

PURPOSE: To provide a correction mechanism which can perform the stable right-left positioning and the tilt correction of forms by controlling these operations to prevent the jam, breakage, etc., of a form that has been conveyed with a large tilt.

CONSTITUTION: A form 3 is conveyed to the positions of sensors 12 and 13, and the tilt amount of the form 3 is measured. If the form 3 tilts in the direction where the side of the form 3 opposite to its reference face 10 travels first with a tilt amount larger than a set value, the revolutions of drive rollers are stopped. Then, the drive rollers are revolved in the direction opposite to the conveying direction of the form 3, and the form 3 is bent between the drive rollers so that the tip of the form 3 touches the drive rollers and a pressure roller 18b. Thus, the tilt of the form 3 is corrected. Then, the drive rollers are revolved forward to bite the form 3 and a pressure roller 18a is lifted together with an oblique roller 9 pressed to a conveying surface. The roller 18b is lifted and the press contact states of both rollers 18a and 18b are canceled for correction of the skew of the form 3. Thus, the form 3 is conveyed.



LEGAL STATUS

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[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

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CLAIMS

[Claim(s)]

[Claim 1] An inclination corrector style of a document characterized by providing the following. Two driving rollers arranged in parallel by conveyance on the street A press roller which pinches a document with this driving roller A means which drives / presses this driving roller and a press roller independently A skew roller aslant attached to the document conveyance direction, and a means which drives / presses this skew roller, Two or more sensors formed in a conveyance on the street, and a guide means formed in a conveyance way edge between said 2 sets of rollers, Sequence of operation is chosen based on the amount of inclinations of a conveyance document obtained by detection of a sensor formed in a datum-level edge of this guide means, and said two or more sensors. Until a document is detected as control to which sag this document between driving rollers and a tip of this document is made to contact the tabling section of one driving roller and a press roller by said datum-level edge sensor A means to perform control to which cancel a press roller, press / drive a skew roller, and the side of this document is made to be pressed against a guide means

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] Especially this invention relates to the inclination corrector style of the suitable document for the airline printer, and OCR / image reader which needs to convey a document in an exact location about the inclination corrector style of a document.

[0002]

[Description of the Prior Art] Conventionally, as an inclination corrector style of a document, for example as indicated by JP,62-38261,B After the tip of contact paper passes the conveyance direction side drive roller in 2 sets of drive rollers arranged in parallel, Carry out inverse rotation to the conveyance direction, make coincidence stop a backside [the conveyance direction] drive roller, sag a document among 2 sets of rollers, a document tip is made to contact the tabling section of a drive roller, and the method which corrects the inclination of a document is learned. Although the above-mentioned method can correct the inclination of a document with an easy configuration, consideration is not made about performing positioning of the conveyance direction of a document, and the direction of a right angle.

[0003]

[Problem(s) to be Solved by the Invention] When printing on a document with a printing frame generally, the longitudinal direction of a document needs not only correction of the inclination of a document but to be positioned. However, with the above-mentioned conventional technology, although correction of the inclination of a document is possible, consideration is not made about positioning of a longitudinal direction. As a method of positioning this longitudinal direction, the method of pressing the document side against datum level, for example with a roller is learned. However, it may be [from which it presses and the inclination precision of a required document is not acquired in a chisel] to datum level with a roller, and concomitant use with the above-mentioned conventional technology can be considered to be the datum-level push reliance in a roller. If the number of the classes of document is one here, it is possible for a roller to be the right-angled and same amount of drives, and to press a document against datum level to datum level, but in pressing against a right angle the document which has the magnitude of varieties, and thickness in datum level, the center-of-gravity location of a document differs from drag force, and fault arises. Then, the method which moves a document aslant to the conveyance direction and is pressed against datum level is taken. However, if it presses and the front amount of inclinations is large also in this case, the document edge section will collide with a datum plane, a form crease and a jam will arise, and the amount of inclinations will increase. The purpose of this invention improves such a trouble and is to offer a stable inclination corrector style also to a document with the large amount of inclinations. Namely, the paper jam of the document conveyed with the big inclination, a crease, etc. are prevented, and it aims at making positioning on either side and correction of an inclination on stability.

[0004]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, an inclination

corrector style of this invention Two driving rollers arranged in parallel by conveyance on the street (17a, 17b of drawing 2), A press roller which pinches a document with this driving roller (18a, 18b of drawing 1), A means which drives / presses this driving roller and a press roller independently (drive motor (not shown) etc.), A skew roller aslant attached to the document conveyance direction (9 of drawing 1), A means which drives / presses this skew roller (a bracket, drive motor (not shown), etc.), It has two or more sensors (12 of drawing 1 , 13) formed in a conveyance on the street, and a guide means (10 of drawing 1) formed in a conveyance way edge between said 2 sets of rollers. A control section (not shown [CPU etc.]) **** actuation sequence is chosen according to the amount of inclinations which may have had an inclination of a conveyance document measured by said sensor. "Control (inclination correction) to which sag a document between rollers arranged to 2 sets of parallel, and the tip is made to contact the tabling section of one driving roller and a press roller" "until a document is detected by said datum-level edge sensor The feature is to perform control (positioning on either side) to which cancel a press roller, press / drive a skew roller, and the side of a document is made to be pressed against a guide means."

[0005]

[Function] In this invention, in order that the edge section of a document may collide with datum level previously when it presses against datum level with a skew roller if the amount of inclinations is large when the inclination of the conveyed document is an inclination of the direction to which the opposite side goes to a datum-level side, after taking an inclination first by bending between 2 sets of drive rollers previously, push reliance to datum level with a skew roller is performed. Since a document is lost with a collision with a big inclination to a datum plane by this, a crease and a jam can be prevented. Moreover, by forming a sensor near the datum level, even if it presses the document of a big inclination with a skew roller, the edge of a document stops the drive of a skew roller to datum level in front of push this slack strongly, and can prevent a form crease and a jam. For example, the inclination of the conveyed document is an inclination to which the opposite side progresses previously to a datum-level side. When the amount of inclinations is larger than the amount of inclinations set up beforehand, after correcting an inclination with the roller (a drive roller and pressure roller) arranged at 2 sets of parallel Press the document side against datum level with a skew roller, and the right-and-left location and inclination of a document are made to correct, and when the amount of inclinations is still larger than the set point, an inclination is corrected with the roller arranged at 2 sets of parallel. Moreover, a document is conveyed with a skew roller and an inclination is corrected with the roller arranged next at 2 sets of parallel until a document is detected by the sensor arranged near the datum level in this case. In addition, in other cases, only the amount of conventions is conveyed with a skew roller. Thus, it is possible to make positioning (shift amendment) on either side and correction of an inclination on stability to the document conveyed with the big inclination.

[0006]

[Example] Hereafter, a drawing explains one example of this invention. The plan of an inclination corrector style [in / in drawing 1 / the 1st example of this invention] and drawing 2 are the sectional side elevations of drawing 1 , and drawing 3 (a) - (e) shows actuation of this example. First, a configuration is explained. The inclination corrector style of this example serves as drive rollers 17a and 17b, the pressure rollers 18a and 18b which counter it, the skew roller 9 aslant attached to the document conveyance direction, the datum level 10 which presses a document, and the sensors 12 and 13 for detecting the amount of inclinations of a document from the form guides 1a, 1b, 2, 3a, and 3b. These pressure rollers 18a and 18b are lifted from drive rollers 17a and 17b with a press discharge means (not shown), respectively, and are constituted free. Moreover, drive rollers 17a and 17b can be independently driven by the driving means (not shown) of a motor etc. Moreover, the skew roller 9 is constituted by the conveyance side free [a pressure welding] with the skew roller vertical drive (not shown). This skew roller vertical drive may consist of the bracket supported by the shaft of for example, a skew roller free [rotation], a motor for a drive, a worm shaft, a belt that transmits driving force. In addition, the control section (for example, processors, such as CPU) which is not illustrated shall perform control of the whole device including control of each driving means.

[0007] Here, the inclination corrective action of this example is explained. First, like drawing 3 (a), a document 3 is conveyed up to a sensor 12 and 13 locations, and the amount of inclinations of a document is measured by sensors 12 and 13. Consequently, when the inclination measured by sensors 12 and 13 is larger than the amount of inclinations which datum level 10 and the opposite side are the inclinations (the inclination direction of the document 3 shown in drawing 1) of the direction which progresses previously, and was set up beforehand, drive roller 17a is stopped. Next, a document 3 is sagged between drive roller 17a and 17b like drawing 3 (b) by making the document conveyance direction and hard flow rotate drive rollers 17a and 17b. In this way, a document tip is made to contact the tabling section of drive roller 17b and pressure-roller 18b, and an inclination is corrected. Next, after rotating drive roller 17b normally slightly and making a document 3 bite like drawing 3 (c), pressure-roller 18a is raised with a press discharge means. Next, like drawing 3 (d), a conveyance side is made to carry out the pressure welding of the skew roller 9 with a skew roller vertical drive, and pressure-roller 18b is raised. Therefore, pressure-welding discharge is carried out also with pressure rollers 18a and 18b. Furthermore, the skew roller 9 is driven, a document 3 is pressed against datum level 10, and a skew is corrected. Like drawing 3 (e), the last is made to carry out the pressure welding of the pressure rollers 18a and 18b, and it conveys by lifting a skew roller at it. Under the present circumstances, the amount of skews is measured by sensors 12 and 13, and in being larger than the amount of inclinations set up beforehand, it operates drawing 3 (b) again. Moreover, the amount of inclinations measured by drawing 3 (a) is smaller than the amount of inclinations set up beforehand, and in being the inclination (inclination of the document 3 shown in drawing 1, and reverse) of the above and hard flow, after lifting pressure rollers 18a and 18b for a document 3 as shown in constant-rate return and drawing 3 (d), lowering the skew roller 9 and performing push reliance to datum level 10, actuation shown in drawing 3 (b) is performed.

[0008] Drawing 4 is the plan of the inclination corrector style in the 2nd example of this invention. In addition to the configuration of the 1st example, this example adds the sensor 14 which detects a document 3 near the datum level 10. In this example, if a sensor 14 detects a document 3 when pushing a document 3 against datum level 10 with the skew roller 9, the drive of the skew roller 9 will be stopped and the inclination correction by bending between drive roller 17a and 17b will be made. Moreover, it is the case in the direction of reverse that the inclination of illustration of a document 3 is large, and when it becomes impossible for the side of a document 3 to detect a document 3 by the sensor 14 in edge 10a of a datum plane 10, after it carries out the constant-rate drive of the skew roller 9 and a sensor 14 detects a document 3, it controls to perform a drive halt of the skew roller 9 like the above.

[0009]

[Effect of the Invention] Positioning of a right-and-left location and correction of an inclination can be made on stability, without generating a form crease, a jam, etc. to the document conveyed with the large inclination according to this invention.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the plan of the inclination corrector style in the 1st example of this invention.

[Drawing 2] It is the sectional side elevation of the inclination corrector style in the 1st example of this invention.

[Drawing 3] It is drawing showing the inclination corrective action in the 1st example of this invention.

[Drawing 4] It is the plan of the inclination corrector style in the 2nd example of this invention.

[Description of Notations]

The edge of 1a, 1b, 2, 3a, a 3b:form guide, 3:document, 9:skew roller, 10:datum plane, and a 10a:datum plane, 12 and 13, 14:sensor, 17a, a 17b:drive roller, 18a, 18b: Pressure roller.

[Translation done.]

* NOTICES *

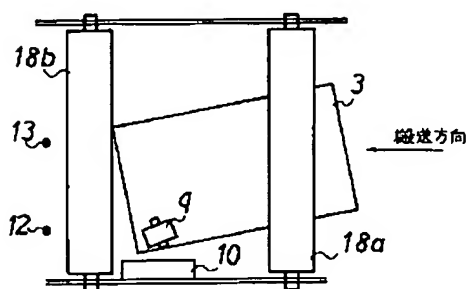
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DRAWINGS

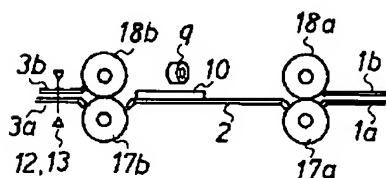
[Drawing 1]

図 1



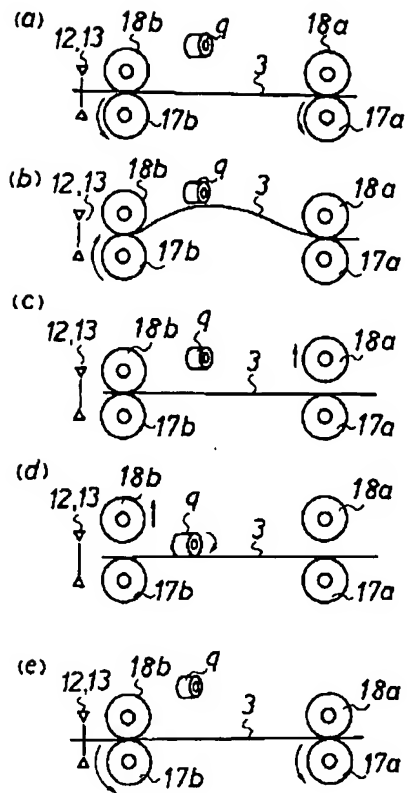
[Drawing 2]

図 2

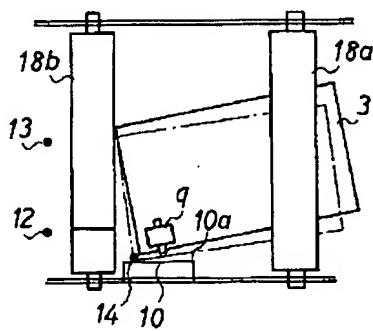


[Drawing 3]

図 3



[Drawing 4]
図 4



[Translation done.]